

CLAIMS

What is claimed is:

1 1. A method of reducing flooding from a network device,
2 comprising:

3 maintaining an unknown address and a count at a first port
4 of the network device, the unknown address being a network address
5 for which there is no information at the first port identifying
6 another port of the network device to which unicast frames
7 containing the unknown address are to be forwarded, the count
8 identifying the number of times frames containing the unknown
9 address have been flooded from the first port to other ports of
10 the network device;

11 upon receiving unicast frames containing the unknown address
12 at the first port while the count is less than a predetermined
13 threshold, incrementing the count and flooding the received frames
14 to the other ports of the network device;

15 when the count has reached the predetermined threshold,
16 determining whether there is information at a second one of the
17 other ports of the network device identifying a specific one of
18 the ports of the network device to which unicast frames containing
19 the unknown address are to be forwarded, and if so then
20 transferring the information from the second port to the first
21 port, whereupon the unknown address becomes known at the first
22 port; and

23 upon receiving unicast frames containing the now known
24 address at the first port, forwarding the received frames to only
25 the specific port identified in the information transferred from
26 such other port to the first port.

1 2. A method according to claim 1, wherein maintaining the unknown
2 address and the count at the first port comprises:

1 7. A method according to claim 1, wherein the first and second
2 ports are included in an aggregated port appearing as a single
3 logical port for frame forwarding purposes.

1 8. A network device, comprising:

2 a plurality of line cards, each line card including a
3 respective port, two of the ports being configurable as an
4 aggregated port forming a single logical connection to another
5 device;

6 the port of a first one of the line cards being a first port
7 operative to:

8 (i) maintain an unknown address and a count, the
9 unknown address being a network address for which there is
10 no information at the first port identifying another port of
11 the network device to which unicast frames containing the
12 unknown address are to be forwarded, the count identifying
13 the number of times frames containing the unknown address
14 have been flooded from the first port to other ports of the
15 network device;

16 (ii) upon receiving unicast frames containing the
17 unknown address from the other device while the count is
18 less than a predetermined threshold, increment the count and
19 flood the received frames to the ports of the other line
20 cards;

21 (iii) when the count has reached the predetermined
22 threshold, determine whether there is information at the
23 port of a second one of the line cards identifying a
24 specific one of the ports of the network device to which
25 unicast frames containing the unknown address are to be
26 forwarded, and if so then obtain the information from the
27 port of the second line card, whereupon the unknown address
28 becomes known at the first port; and

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29 (iv) upon receiving unicast frames containing the now
30 known address from the other device, forward the received
31 frames to only the specific port identified in the
32 information transferred from the port of the second line
33 card to the first port; and
34 the port of the second line card being a second port
35 operative to:

36 (i) receive unicast frames from ports of the other line
37 cards and transmit the received frames to the other device;

38 (ii) upon receiving unicast frames from ports of the
39 other line cards, learn respective associations between
40 addresses in the received frames and the ports from which
41 the frames are received; and

42 (iii) provide the information concerning the unknown
43 address to the first port from the learned associations.

1 9. A network device according to claim 8, wherein the first port
2 is further operative when maintaining the unknown address and the
3 count to:

4 determine, upon flooding a unicast frame containing the
5 unknown address, whether a bin has been established for the
6 unknown address and the count; and

7 if the bin has not been established, then establish the bin
8 and initialize the count to one.

1 10. A network device according to claim 9, wherein the first port
2 is further operative when establishing the bin to determine
3 whether a predetermined maximum number of bins have already been
4 established, and establish the bin only if the predetermined
5 maximum number of bins have not already been established.

1 11. A network device according to claim 8, wherein the first port
2 is further operative to:

maintain a forwarding table at the first port, the forwarding table containing entries associating known addresses with corresponding ports;

upon receiving the unicast frame, search the forwarding table using the address contained in the frame to determine whether the address is known at the port; and

upon the transfer of the information from the second port, add a corresponding entry to the forwarding table.

12. A network device according to claim 11, wherein the first port is further operative to participate in a periodic re-synchronization of the forwarding table with a forwarding table of the second port.

13. A network device according to claim 8, wherein the first port is further operative to monitor how long the address and count are maintained, and upon maintaining the address and count for a predetermined maximum time before the count has reached the predetermined threshold, then discard the address and count.

14. A network, comprising:

a plurality of stations;

a bridge coupled to a first subset of the stations; and

a network device coupled to the bridge and to a second subset of the stations via corresponding physical ports of the network device, the coupling between the network element and bridge being in the form of an aggregated port including at least first and second physical ports, the network device being operative to:

(i) maintain an unknown address and a count at the first port of the network device, the unknown address being a network address for which there is no information at the first port identifying another port of the network device to

14 which unicast frames containing the unknown address are to
15 be forwarded, the count identifying the number of times
16 frames containing the unknown address have been flooded from
17 the first port to other ports of the network device;

18 (ii) upon receiving unicast frames containing the
19 unknown address at the first port while the count is less
20 than a predetermined threshold, increment the count and
21 flood the received frames to the other ports of the network
22 device;

23 (iii) when the count has reached the predetermined
24 threshold, determine whether there is information at the
25 second port of the network device identifying a specific one
26 of the ports of the network device to which unicast frames
27 containing the unknown address are to be forwarded, and if
28 so then transfer the information from the second port to the
29 first port, whereupon the unknown address becomes known at
30 the first port; and

31 (iv) upon receiving unicast frames containing the now
32 known address at the first port, forward the received frames
33 to only the specific port identified in the information
34 transferred from such other port to the first port.